

Name: _____

Date: _____

Exam: Function Reflections (Solution version 17)

1. Let function f be defined by the polynomial below:

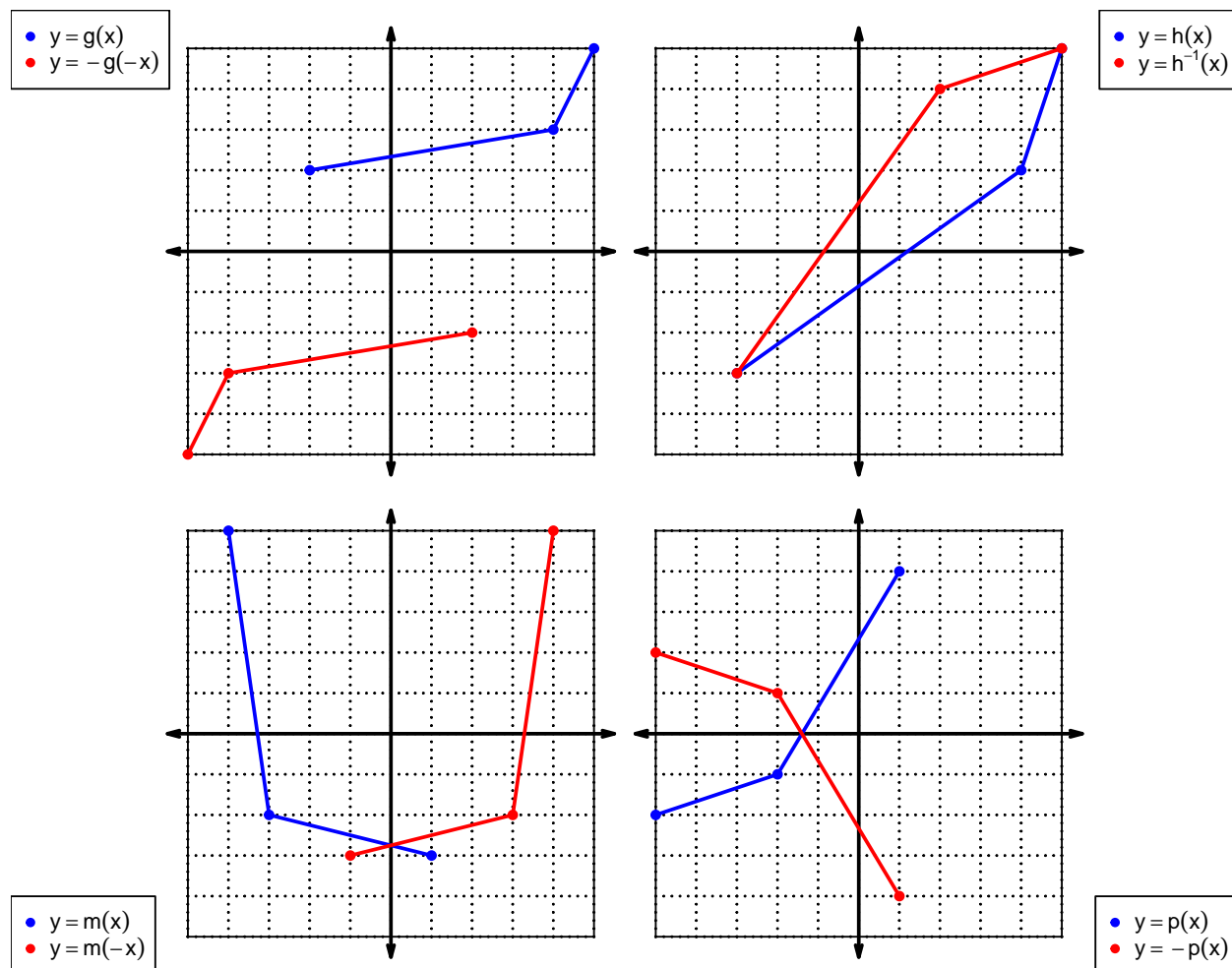
$$f(x) = -9x^5 - 2x^4 - 7x^3 + 5x^2 + 4x - 6$$

Draw lines that match each function reflection with its polynomial:

Reflections**Polynomials**

$f(-x)$	●	●	$9x^5 + 2x^4 + 7x^3 - 5x^2 - 4x + 6$
$-f(x)$	●	●	$-9x^5 + 2x^4 - 7x^3 - 5x^2 + 4x + 6$
$-f(-x)$	●	●	$9x^5 - 2x^4 + 7x^3 + 5x^2 - 4x - 6$

2. In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions f , g , and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	3	7	2
2	5	9	6
3	6	8	9
4	4	3	1
5	9	4	3
6	2	5	8
7	8	2	5
8	7	1	4
9	1	6	7

3. Evaluate $g(6)$.

$$g(6) = 5$$

4. Evaluate $f^{-1}(8)$.

$$f^{-1}(8) = 7$$

5. By filling more rows of the table, it is possible to make function f **even**. If that were done, what would be the value of $f(-1)$?

If function f is even, then

$$f(-1) = 3$$

6. By filling more rows of the table, it is possible to make function h **odd**. If that were done, what would be the value of $h(-9)$?

If function h is odd, then

$$h(-9) = -7$$

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7. A function, f , is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g , is **odd** if $g(x) = -g(-x)$ for all x in the domain.

Let polynomial p be defined with the following equation:

$$p(x) = -x^3 - x$$

- a. Express $p(-x)$ as a polynomial in standard form.

$$p(-x) = -(-x)^3 - (-x)$$

$$p(-x) = x^3 + x$$

- b. Express $-p(-x)$ as a polynomial in standard form.

$$-p(-x) = -(x^3 + x)$$

$$-p(-x) = -x^3 - x$$

- c. Is polynomial p even, odd, or neither?

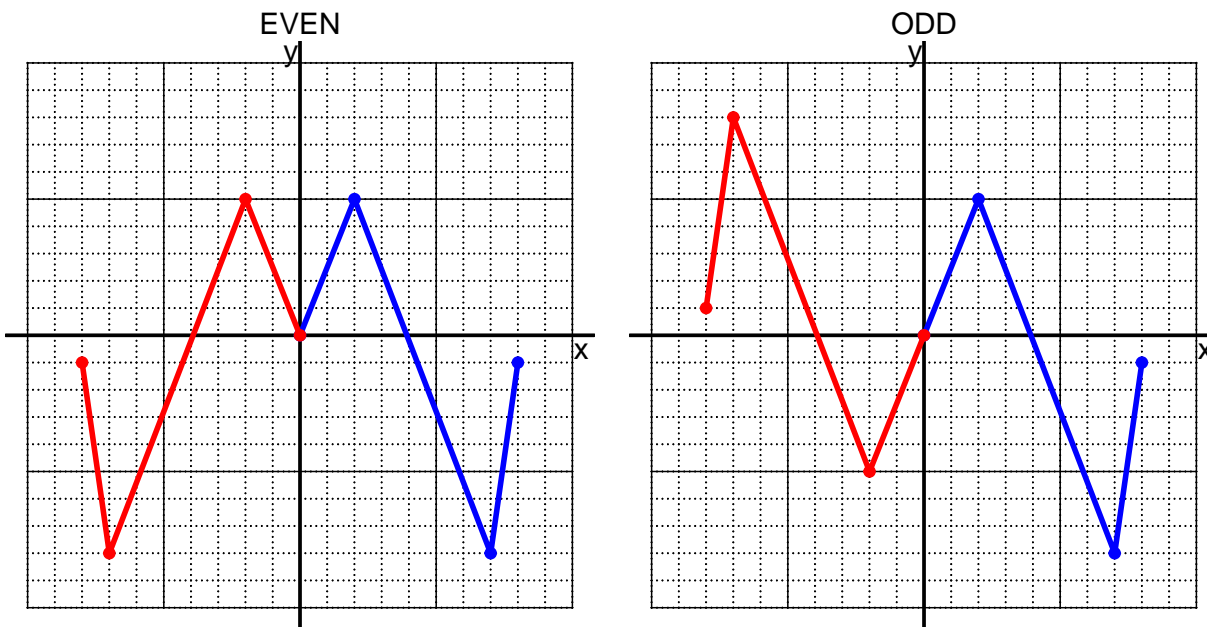
odd

- d. Explain how you know the answer to part c.

We see that $p(x) = -p(-x)$ for all x because $p(x)$ and $-p(-x)$ are equivalent polynomials. Thus function p satisfies the criterion for being an odd function.

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8. I have drawn half of a function. Draw the other half to make it even or odd.



9. Let function f be defined with the equation below.

$$f(x) = 2x - 7$$

a. Evaluate $f(42)$.

step 1: multiply by 2
step 2: subtract 7

$$f(42) = 2(42) - 7$$

$$f(42) = 77$$

b. Evaluate $f^{-1}(85)$.

step 1: add 7
step 2: divide by 2

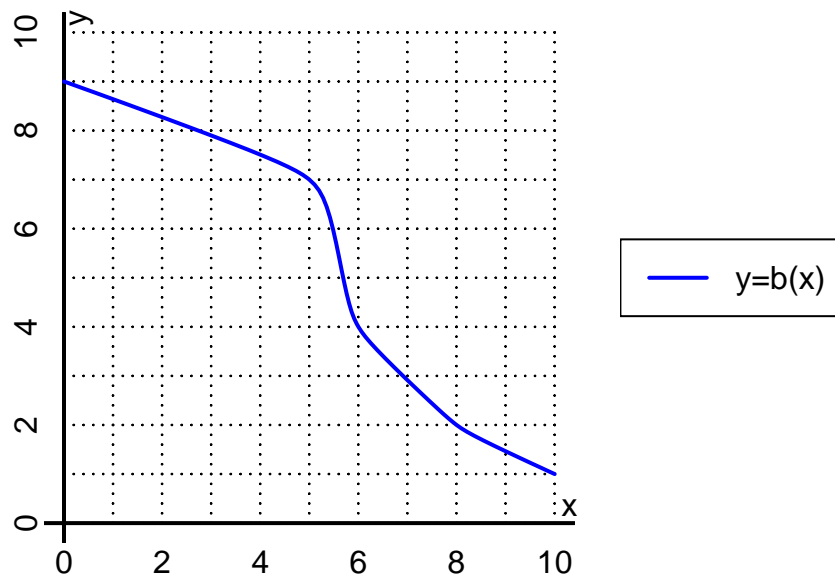
$$f^{-1}(x) = \frac{x + 7}{2}$$

$$f^{-1}(85) = \frac{(85) + 7}{2}$$

$$f^{-1}(85) = 46$$

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10. The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(8)$.

$$b(8) = 2$$

b. Evaluate $b^{-1}(7)$.

$$b^{-1}(7) = 5$$

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11. Function f is defined by the table below.

a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	-3	3	-3	3
-1	-5	5	5	-5
0	0	0	0	0
1	5	-5	-5	5
2	-3	3	-3	3

b. Is function f even, odd, or neither?

neither

c. How do you know the answer to part b?

Function f is neither because neither column $-f(-x)$ nor column $f(-x)$ matches column $f(x)$ exactly.